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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,476	12/21/2001	Jimmy Kuo Chen	276440-21	9965
27520	7590	08/27/2004	EXAMINER	
FORMFACTOR, INC. LEGAL DEPARTMENT 2140 RESEARCH DRIVE LIVERMORE, CA 94550			NGUYEN, DONGHAI D	
			ART UNIT	PAPER NUMBER
			3729	

DATE MAILED: 08/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/027,476

Applicant(s)

CHEN, JIMMY KUO

Examiner

Donghai D. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 16-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 16-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/26/04; 7/1/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 01, 2004 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

3. Claims 1-12 and 16-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "a contactor ... the substrate" (claim 1, lines 4-6) is vague and indefinite since it is uncertain as to what a contactor comprising of. Does it comprise only the substrate and the plurality of conductive [sic]? Or it also comprises the interconnect structures. If the interconnect structures are not part of the contactor, then it is unclear as to the relationship between the interconnect structures and the plurality of conductive. If the interconnect structures are part of the contactor comprises, then it is unclear how "the oscillating electromagnetic field heating the interconnect structures without substantially heating the contactor" (claim 1, lines 8-9).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-7, 10, 11, and 16, as best as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Chan et al.

Regarding claim 1, Chan et al disclose a method for heat treating a plurality of conductive interconnect structures attached to a substrate, the method comprising the steps of: providing a contact (30-35) comprising a substrate (10) and a plurality of conductive (13 in Fig. 1), interconnect structures (30/32, 31/33, etc.), each of the interconnect structures is attach to a terminal (34, 35) on the substrate and comprising a contact tip (parts that contact pad 43, 44, in Fig. 4) dispose away from the substrate; placing the contact in an oscillating electromagnetic field (23/24), the oscillating electromagnetic field heating the interconnect structures without substantially heating the contactor (Col. 2, lines 46-48); maintaining the contactor in the oscillating electromagnetic field until each of the interconnect structures obtains a defined heat-treatment temperature substantially greater than an ambient temperature (col. 2, lines 65-68); removing the contactor from the oscillating electromagnetic field and cooling the contactor to the ambient temperature (Note Chan et al inherently disclose these two steps when he finishes applying the electromagnetic field) and thereby improves a mechanical operating property of the contactor (inherently, since Chan et al's method having the exact steps and structures as claimed therefor the same result is expected).

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Regarding claims 2 and 3 see Chan et al's Col. 3, lines 3-11.

Regarding claims 4 and 10-11, Chan et al disclose tuning the oscillating electromagnetic field to selectively heat the ferromagnetic material (See Graphs 5-8).

Regarding claims 5 and 6, Chan et al's Fig. 3 shows the range of temperature depends on the composite of the ferromagnetic material, therefore, it capable of obtaining the temperature greater than 800 °C and 1300 °C.

Regarding claim 7, Chan et al's Figs. 2-3 show generating the oscillating electromagnetic field between a pair of parallel plates (23/24).

Claim 16 also met as set forth above in claim 1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 8 and 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al.

It would have been an obvious matter of design choice for generating the oscillating electromagnetic field by using a hairpin coil or a coil comprised of a copper tube formed into a coil shape, since Applicant has not disclosed that the claimed specific device for generating the oscillating electromagnetic field by using a hairpin coil or a coil comprised of a copper tube formed into a coil shape, solves any stated problem or is used for any particular purpose and it

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appears that the invention would perform well with the device (23/24) that generating the oscillating electromagnetic field of Chan et al.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al in view of Barrett.

Chan et al do not disclose measuring a temperature of the interconnect structures by applying a heat-indicating paint to the interconnect structures prior to the maintaining step. Barrett teaches the step of applying a heat-indicating paint to the interconnect structures for measuring a temperature (col. 3, lines 9-17). It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Chan et al to apply a heat-indicating paint to the interconnect structures as taught by Barrett for measuring temperature.

9. Claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al in view of Khandros.

Chan et al disclose the claimed invention of heat treatment contactor, except the contactor comprising an interposer and is for contacting semiconductor wafer. Khandros discloses the contactor (59) comprising an interposer (Fig. 21) and is for contacting semiconductor wafer (Abstract, last four lines) for electrically interconnecting between two substrates of surfaces of substrate (col. 15, lines 65-66 and Col. 16, lines 8-16). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Chan et al to have the contactor comprising an interposer and is for contacting semiconductor wafer as taught by Khandros for interconnecting between two substrates of surfaces

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10. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan et al in view of Chen et al.

Chan et al disclose the claimed invention of interconnect structures, except the interconnect structures are springs. Chen et al discloses the interconnect structures (212) are springs (Figs. 2-3) and heat treatment to prove mechanical properties of the springs (Abstract, lines 1-3) for providing a resilient conductive contact (Abstract, last three lines). It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Chan et al to have the interconnect structures are springs as taught by Chen et al for providing the resilient conductive contact.

Response to Arguments

11. Applicant's arguments with respect to claims 1-12 and 16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

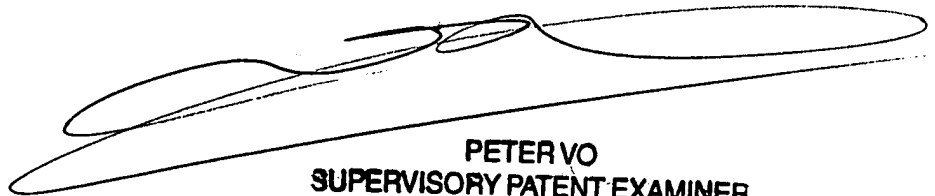
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghai D. Nguyen whose telephone number is (703) 305-7859. The examiner can normally be reached on Monday-Friday (9:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter D. Vo can be reached on (703) 308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DN



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